

## ATHANASIUS KIRCHER AND THE MAGIC LANTERN

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ATHANASIUS KIRCHER is said to have invented the magic lantern, the date of the invention being given variously as 1646, 1664 or 1671. In the *Observer* exhibition held last summer in London he was featured, along with Lucretius, Ptolemy and Leonardo da Vinci, as "discovering a principle involved in Cinematography," and in a history of the silent film published last year in Germany—*Unsterblicher Film*, by Heinrich Fraenkel—he is mentioned as having converted the camera obscura into a magic lantern.

In his *History of Light* published in 1772 Joseph Priestley says, pp. 122–3, with reference to Kircher :

" . . . we are perhaps, at this day, most obliged to him for his ingenious contrivance of the Magic Lantern. . . . Those who chuse to see Kircher's own drawing of this ingenious instrument will find some very fine ones in his *Ars Magna Lucis et Umbrae*, pp. 768–9. He will there see that the inventor of this instrument had sliders filled with images such as we make use of at this day ; but he will also see that Kircher, with all his ingenuity, of which it is impossible not to conceive a very great opinion, had not the art of making his lamp burn without smoke ; though it is possible that the designer he employed might, in order to shew his skill in drawing, make a greater cloud of smoke both from the lamp, and the chimney belonging to this instrument than, in fact, ever issued from them."

The drawings that Priestley refers to are two in number. One is reproduced opposite. Now the essential principle of the magic or projection lantern is that there are two lenses or lens systems, the projector and the condenser. The projector forms an image of the slide on the screen and the condenser forms an image of the source of light on the projector. The picture on the slide is inverted and the image on the screen is erect. In Kircher's drawing there is no projector and both object and image are erect. He is obviously casting a shadow on the screen, not forming an image on it. His



other drawing is equally clear on this point ; it differs from the first one only in the way in which the lamp is supported.

Kircher was born in Thüringen in 1601. He was educated at the Jesuit college at Fulda and became a novice of the order at Mayence in 1618. He taught mathematics, philosophy and oriental languages at Würzburg, whence he was driven in 1631 by the Thirty Years War to Avignon. In 1635 he settled at Rome and spent the rest of his life there. Except for some teaching when he was a young man he was allowed to devote the whole of his life to study.

The first edition of his book on light, *Ars Magna Lucis et Umbrae*, was published at Rome in 1646, the second enlarged edition at Amsterdam in 1671. The second edition is a most impressive volume containing about 600,000 words and 810 + xliii pages, the page measuring  $15 \times 9\frac{1}{2}$  inches. Both editions describe a method of throwing images into a darkened room from without by means of a convex lens and a plane mirror. Words were written on the face of the mirror, inverted and reversed, or drawings were made on the face of the mirror. Then the mirror was used to throw the rays of the sun into the room ; the lens was placed in the path of the rays between mirror and room and focussed the writing on the wall of the latter. It is said that in this way an image could be thrown a distance of 500 ft. In any case sensational effects could be produced and it appears that, when he was a young man, Kircher acquired a reputation for the experiments he performed with this arrangement.

The first edition contains no reference to the *lucerna magica*. The second gives the two pictures referred to above with about 700 words of description, but the description is confused. Kircher says that he made the discovery and left it, that others then turned their attention to it, the first of these being Thomas Walgenstenius, a Dane, who improved the lantern and sold it with great profit to himself. He states at one point that the object at H should be inverted, but concludes by stating very definitely that the action of the lantern is better explained by the pictures than if he were to use more words. The pictures show the arrangement in use in the college at Rome.

I have not been able to find out anything about Thomas Walgenstenius. But Kircher's whole book is so confused and fantastic that it is difficult to believe that the author is a contemporary of Galileo and Newton or that he understands what he is writing about.

Having come to this result I looked him up in the *Allgemeine Deutsche Biographie* and found ample confirmation of my conclusion there. After describing his work on Egyptology the writer says :

"I have gone into these works of Kircher in detail, because it

was my purpose to show him as the charlatan he was. He had a many-sided education and great zeal, but only superficial knowledge, and no idea of method ; he was a diligent worker, but he was neither reliable nor thorough. He was not the researcher for whom it is sufficient if the experts appreciate his work ; what his nature required was the empty admiration of the so-called ' wider circles ' and to retain this he stooped to falsification."

With reference to his other work the writer says :

" And all these folios and quartos contain according to the judgment of experts not one addition to knowledge. Here too he prefers to deal in the mysterious and the fantastic, number mysticism and similar topics. . . . The instruments which he discovered are mostly trifling ; the most interesting would be the magic lantern, if this is really Kircher's work."

His drawings and the accompanying text make it almost certain that it is not.